CHAPTER FIVE

PRODUCTION AND DEPLOYMENT PHASE
(Post-Milestone III)

INTRODUCTION

The final linkage in our discussion of A_O extends to the post-deployment period for the system following Milestone III. Clearly, operational availability is an important aspect of weapons system acquisition. It is an equally important indicator of system performance once the system has been approved for partial or full introduction into the Fleet. In today's logistic process, logistic policies are more and more frequently geared to direct measures of weapons system availability, such as A_O, and less to more traditional indicators of material support. Thus, the Sponsor must continue to be cognizant of how the actual operational availability of the system relates to the A_O threshold which drove earlier acquisition decisions. Of particular concern must be the consistency of system attributes and application between the acquisition planning which has been completed and the Fleet perception and use of the system once deployed.

The ultimate system user and evaluator is the Fleet. Regardless of the criteria contained in the TEMP and the results of testing, the Fleet will immediately and continuously, although perhaps not consistently, provide the Sponsor feedback on all aspects of the new system. The criteria used by the Fleet to evaluate the new system is the Fleet perception of what the system was designed and procured to accomplish, and whether the Fleet has the right resources at the required locations to restore the system to full operation when it does fail. The planned operating scenario and environment, the maintenance plan, and the ILSP for the system are immaterial to the Fleet. If the Fleet has need of the capabilities of the new system in a given operation and the system is unavailable for that operation then the system is considered deficient.

The Sponsor must be acutely aware of the above fact of life, but must in a sense desensitize himself/herself personally at the outset to the form of the criticism of the system and instead concentrate on the substance of the Fleet input. This chapter will concentrate on the production, deployment, and follow-up support of the system and the Sponsor's role in this process.

To this point in the acquisition process, operational availability has been used as a threshold or objective function. The Sponsor must now begin to consider operational availability as both a process and a measure of achievement. The process is the measuring of the interdependent impacts of shortfalls in the components of A_O on each other, on the system/sub-systems/equipments, and on the components of A_O and their sub-elements. The objective of this analysis of interdependent effects is to focus the management attention of the Sponsor on those critical resources that adversely affect thresholds and deployment schedules while providing continuous and consistent monitoring of all program specifications. System performance must now be monitored and evaluated and the Sponsor must be aware of deficiencies in the actual A_O achieved relative to the A_O threshold established for the system.

More specifically, OPNAVINST 5000.49A requires that whenever actual A_O experienced in the Fleet falls below the established CNO A_O threshold by more than 5 percent, a plan for corrective action must be developed by the Developing Agency/Program Manager. The Sponsor must ensure this action, as needed, is taken effectively and expeditiously.

The most critical risk during this phase is the short leadtime available to correct anything that does go wrong. Once the first system begins proceeding down the production line, the time available to correct deficiencies or to react to changes in design diminishes rapidly. All the pieces

of acquisition come together at Initial Operational Capability (IOC). When the first production system is installed in the Fleet and is deployed, everything is supposed to be in place to operate, maintain, and support the system in its operating environment. Recovery is often a costly and time-consuming process.

ESTABLISHING A_O REQUIREMENTS

The system operational availability threshold and the parameters for reliability, maintainability and supportability were established and approved at Milestone II. These thresholds were reapproved, either the same as at Milestone II or as modified, at Milestone III based on actual system tests. Therefore, the Sponsor is not concerned with establishing, A_O requirements in the Production and Deployment Phase; rather, he/she is concerned with the attainment of the required thresholds in the production models of the system once the system is actually deployed in the Fleet. Accordingly, this chapter concentrates on the process of monitoring and evaluating the A_O threshold in Fleet use.

MONITORING AND EVALUATING A_O

Key Action Steps

For the Sponsor, the post-deployment period requires that three major tasks be completed:

1. Validate Production Model Specifications

   The production model must be validated to ensure it contains all of the design characteristics of the prototype. Variance from system specifications must be identified and managed.

2. Approve Post-Deployment A_O Monitoring Plan

   Critical elements of the A_O composite index (MTBF, MTTR, and MLDT) must be monitored over time using an approved readiness assessment plan.

3. Confirm Achievement of Deployment A_O

   All of the ILS elements must be in place at IOC to support the required system A_O following deployment.

Basic Data Requirements

To accomplish the necessary monitoring and evaluation of the A_O index following system deployment, the Sponsor should have available the following key documents or should access the following important information sources:

- The Logistics Support Analysis Record (LSAR)
- Test and Evaluation Results and the TEMP

- Fleet Casualty Reports (CASREPs), 3-M Reports, Commanding Officer Narratives (CONARS), and other Fleet operating reports which provide problem identification by system
- PSICP A_O Reports generated by the Navy Ships Parts Control Center (SPCC) or the Navy Aviation Supply Office (ASO) as appropriate
- Failure rate analysis prepared by the In-Service Engineering Activity (ISEA), depot repair facilities, or intermediate maintenance activities
- Mean Logistics Delay Time data for the system from the FMSO Requisition Response Time Management Information System (RRTMIS) data base
- A_O data generated from any established system monitoring scheme put in place by the Developing/Support Agency.

Accomplishing Key Action Steps

The system will likely lose some specific identity at the OPNAV level in terms of an assigned Sponsor following Milestone III and may often revert to the general OPNAV organization (OP-02, OP-03, OP-05) responsible for the overall weapons/warfare area. Accordingly, it will be the primary responsibility of the cognizant material support organization (possibly through a Program Manager) to maintain on-going surveillance and evaluation of actual system A_O relative to the established A_O threshold for the system.

1. Validate Production Model Specifications

Testing at Milestone III has confirmed that the system design and its prototype model provide the capabilities and meet the A_O thresholds established for the system. This does not guarantee that the production model will be the same. Reliability (MTBF) is the single biggest contributor to system material readiness. It is also the most intractable, the most expensive to alter, and the one that affects nearly every other element of material readiness when it changes. This component of A_O is the most critical of the factors the Sponsor must monitor and any changes to the system design (at any level of indenture) will impact all other interdependent elements.

To ensure control of the configuration of the production model and all of its component parts, the Program Manager must have established a Configuration Management Plan (CMP) prior to Milestone III. The heart of the CMP is the product baseline configuration. This baseline configuration documents the form, fit, and function requirements of the system and all of its parts. It includes fabrication and design specifications and drawings that establish detailed parts descriptions including performance requirements, test and inspection requirements, tolerances, assembly and acceptance criteria. The Sponsor should review the CMP to ensure consistency of reliability design with previous planning.

2. Approve Post-Deployment A_O Monitoring Plan

Before the Program Manager deploys the first system, a methodology based on DODD 5000.39 of 17 November 1983 (NOTAL) and the OPNAVINST 5000.49A for monitoring system performance must be in place and functioning. These

directives require the development of plans and the assignment of responsibilities for follow-on readiness assessments beginning with system deployment, and continuing until the system design and support configuration are mature. The sophistication of the reporting and monitoring system will depend on the complexity of the system and the level of detail necessary to identify problems and isolate those problems for resolution. For example, the MK-86 GFCS has a very detailed reporting system that monitors:

- Total system A_O, MTBF, MTTR and MLDT.
- The A_O, MTBF, MTTR and MLDT for three of the system's four modes of operation. (Two of the four modes of operation, indirect gunfire support and direct gunfire support, are the same for measurement purposes).
- Uptime and downtime, deployed and non-deployed periods, for each ship in which the system is installed.
- Subsystem equipments and components experiencing reliability problems.
- High usage repair parts and supply system response times to provide those parts.

The system reports contain other information and displays the data in matrix form, pie charts, time line progressions, and narrative. The report is published quarterly and requires special reporting by the ships, special compilation and drafting by the responsible shore activity and printing and distribution costs. For this system, the Program Manager required this level of detail and developed a comprehensive reporting system to provide that detail and executed that plan. However, the sophistication of the above tracking and monitoring system is not required for all programs. A readiness assessment can be as simple as dividing calendar time free of C2/C3/C4 CASREPs by total calendar time for each installation and averaging the results across the installations. This is a very gross calculation for A_O, but it may be sufficiently accurate for an auxiliary generator. A_O for a missile is number of successful launches divided by the number of attempts since the missile is a nonrecoverable, go-no go system. The disadvantage of these methods of monitoring is that it does not identify the components of reliability, maintainability, or supportability causing problems. The Program Manager must essentially assess the future requirement for a given level of detail and determine whether the costs to obtain and compile that data over the period of time to system maturation is worth the cost. The Program Manager must minimize the reporting systems while satisfying the requirement to measure the achievement of readiness thresholds. The Sponsor should review Program Manager planning for this reporting and monitoring to ensure it is adequate. It is recommended that the Sponsor formally approve the A_O measurement and monitoring scheme to be used in the post-deployment period.

3. Confirm the Achievement of Deployment A_O

At this phase of the acquisition, an experienced ILS manager should have been assigned by the Developing Agency to bring everything together to support the fielded system and achieve the operational availability requirement. Without this

dedicated ILS manager, the system, regardless of complexity, will not be completely or adequately supported at the time of Initial Operational Capability. There are too many interdependent elements of logistic support, each managed by different commands, and each comprised of innumerable factors, codes and data elements to leave to standard operating procedures (or chance) that all will be in the right place, at the right time, and in the right configuration. The ILS manager orchestrates this process, reduces uncertainty in support planning, ensures the compatibility of resources, diminishes the duplication of action and coordinates and synchronizes the transition of support tasks from the contractor to the Navy.

At this phase in the acquisition, the reliability and maintainability should be locked into the system design. As long as that stability is maintained, the consistency between and among the various planning documents, the scheduled development and delivery of support elements, and the budgeted cost of each element should track as planned to ensure that the system is installed, the trained personnel are on-site, and resources required to sustain inherent performance of the system are positioned simultaneously.

From the Sponsor perspective, the on-going A_O monitoring and evaluation by the support organization should also be reviewed periodically to ensure consistent and active assessment is taking place. In a real sense, the Sponsor must represent Fleet and operational interests in ensuring that the system A_O threshold is maintained after system deployment and that, where problems prevent the attainment of the A_O threshold, active plans are underway to resolve these problems.

When shortfalls in the achievement of readiness thresholds occur, the Program Manager must identify the cause, assess the impact, determine the fix and execute the solution. This is not easy. Identification of the cause is the most difficult of these to accomplish. The more complex the system, the more difficult the job of isolating the problem becomes. Potential problem areas or sources to be validated by the Sponsor include:

- Supply Support: the supply system bought an insufficient inventory or the procurement leadtimes have increased significantly and the degradation to the system availability is, in fact, a supply support problem.
- Parts Reliability: the basic product specifications provided a planned or design replacement factor or failure rate for each part in the system which has not been achieved in operation.
- Maintenance Practices: Fleet maintenance practices not anticipated in the established maintenance plan are generating higher parts usage/different parts usage than planned for or are taking longer.
- Increased System Utilization: the Fleet may have discovered new capabilities not anticipated, or the predicted system utilization rate may have been grossly understated.
- Technical Data Errors: data voids or errors often cause a higher than normal demand for parts when the technical manual gives the incorrect part number, or the part number to National Stock Number (NSN) cross reference list misidentifies the correct NSN, or the part

has been modified such that it cannot be used in older configurations of the equipment but it still has the same NSN as the obsolete configuration.

The potential problem areas cited should be reviewed and evaluated by the Sponsor to validate the major source or cause for the A_O deficiency identified by the Program Manager. Once the problem is determined, the Program Manager must contend with the leadtime to develop, procure, deploy the fix and, most importantly, assess the effects on other elements of maintainability and supportability until the fix is in place. The immediate degradation may not significantly affect other parts, equipments or subsystems, but a prolonged degradation may have a deteriorating effect. The Program Manager must therefore also consider time factors as well as funding and hardware considerations in prioritizing the backfitting of the fix. The Sponsor should support and assist the Program Manager in this effort.

Documentation Required

A number of important documents are mandated by DODD 5000.39, in the Post-Milestone III phase of the acquisition. These major documents include:

1. Post Production Support (PPS) Plan: Development of a plan for post production support begins at Milestone III and is updated throughout the production cycle. As part of the ILSP, this plan provides for continued support for the life cycle of the system after the production line is closed. The PPS includes: the schedule for program production line closing; whether continuing contractual coverage is required for proprietary hardware or software; whether the government will buy those rights in data; whether the government will make a "life-of-type" buy of all proprietary piece parts to support the system throughout its life-cycle; whether the system will be supported by the contractor depot or whether transition to an organic Navy depot is required; and procurement of all system technical specifications in sufficient level of detail for reprocurement from competitive sources.

2. Transition plan: This plan provides the schedule, responsibilities and strategy for shifting supply support and depot level maintenance support from the contractor to the Navy. This plan must accommodate budget cycles, administrative and procurement leadtimes, and the orderly transfer of engineering and technical data required for Navy activities to have support in place on the date of transition.

3. The Program Manager plan for the follow-on tracking, monitoring, and reporting of actual system A_O, and for the elements of the A_O index.

Two additional documents that are not mandated but are considered essential to the orderly and efficient deployment of the system are: (1) the delivery schedule, and (2) the Fleet feedback plan.

A_O COST TRADE-OFF ANALYSIS

Key Action Steps

In the deployment phase of systems acquisition following Milestone III, there is no specific on-going analysis of A_O versus cost trade-offs by the Sponsor. Rather, the orientation shifts to A_O performance relative to established A_O thresholds. Where Ao shortfalls exist based on actual performance, the Sponsor's major action responsibilities are to:

1. Review and Validate A_O Funding Shortfalls

   Ensure that the solution developed by the supporting organization is the most cost-effective alternative available.

2. Validate Cost Estimate Documentation

   Cost estimates associated with the proposed solution should be reviewed to ensure they are realistic, well-documented, and defensible.

Basic Data Requirements

These data sources outlined earlier for monitoring and evaluating A_O following Milestone III provide the basis for the Sponsor's evaluation of A_O versus cost trade-offs where demonstrated system deficiencies must be rectified.

Accomplishing Key Action Steps 1 and 2

In the period following Milestone III, the Sponsor must carefully assess costs associated with remedial plans to improve system A_O. Emphasis should include:

1. What component of the A_O index is responsible for the A_O shortfall?

2. Is improvement in this component the most cost effective solution or would offsetting changes in one or both of the other components provide the necessary A_O improvement at a lower overall cost?

3. Has the supporting organization demonstrated that the projected A_O improvement is feasible based on the proposed solution planned?

Documentation Required

At this point in the acquisition cycle, all program documentation has been completed which is essential to the analysis of A_O cost trade-offs and has been previously provided. Appendix A provides a detailed index of policy and data sources that can be used by the Sponsor.